

Remarks

Reconsideration is requested in view of the following remarks. Claim 11 is amended to correct an obvious typographical error and new claims 23-26 are presented for consideration. Upon entry of this Amendment, claims 1-5, 7-12, 14, and 19-26 are pending. Claims 1, 9, and 25-26 are independent. Support for new claims 23-26 can be found in the application at, for example, pages 19-20. No new matter is introduced.

Response to Advisory Action

The Advisory Action of July 21, 2009 states that new claims 23-24 presented in the July 9, 2009 Amendment after Final (and included in this Amendment) present new issues that require further consideration and search. Applicants request examination of these new claims. In addition, the Advisory Action states that Odom, col. 4, lines 31-36 describes a system that passively collects mouse movement data. Applicants respectfully disagree as discussed below.

Claim Rejections under 35 U.S.C. §103 in View of Brown and Odom

Claims 1, 2, 9-12, and 19 stand rejected as obvious from a combination of Brown et al., U.S. Patent 5,557,686 (hereinafter Brown) and Odom, U.S. Patent 7,350,078 (hereinafter Odom). This rejection is traversed.

Neither Brown nor Odom teaches or suggests at least “a data interception unit for receiving inputs from a user, wherein the data interception unit is configured to passively collect mouse data generated in response to the user” as recited in claim 1.

In contrast to claim 1, both Brown and Odom teach actively receiving data that is generated in response to predetermined keystroke sequences or predetermined mouse gestures. For example, according to Brown, user access is provided as follows:

30 sample is from an authorized user. Last, when a user desires access to the system, the user types the previously determined keystroke sequence which is constructed into a vector and fed into the trained neural network. Note that alternative

See Brown, col. 2, lines 29-32. Thus, Brown merely teaches that authorization is based on the user duplicating a previously entered keystroke sequence.

Odom fails to cure the deficiencies of Brown. According to Odom, data submissions by a user can be passively terminated when sufficient data is received so that an authentication decision can be made. But these passively terminated data submissions are user attempts to duplicate previous actions chosen by the user or presented to the user for use as an authentication key:

- 10 Historically, validation 18 has required an absolute signal
match 5 to input 22: for example, no deviance from a
character-based password has been permitted. With mouse
107 movements, or other difficult-to-exactly-replicate sig-
nals 2, however, some tolerance may be permitted. Signal 22
15 tolerance should be allowed when appropriate, and may be
set by software-determined protocol or user selection. For
example, deviance up to 10% from recorded signal match 5
for keystroke timing 211 may be acceptable. Similarly, as
another example, mouse click location may vary within a
20 radius of 10 pixels and still be tolerated. As multiple signals
2 may comprise a submission 9, the need for exactness for
any single signal 2 to properly authenticate access 97 is
lessened.

See Odom, col. 4, lines 10-23. Thus, according to Odom, user authentication is based on specific predetermined mouse gestures which a user attempts to duplicate. In contrast, according to claim 1, mouse data is collected passively, that is, without instruction or prompt by the computing system and without the user being called upon to perform any particular actions or sets of actions. Thus, both Brown and Odom describe methods for user authentication based on user duplication of predetermined sets of actions. In both Brown and Odom, the user is expected to provide the same predetermined data to be granted access. According to claim 1, verification is based on how the user performs *any* series of actions, that is, based on passive data collection.

The Advisory action states that Odom discloses a system that passively collects mouse movement data. Odom, col. 4, lines 31-46. Applicants respectfully disagree. According to Odom,

through a prescribed indication 25. With passive termination 77, software terminates submission 9 without overt user action, but instead when a predetermined condition is met 26. Examples of passive termination 77 include: recording 35 mouse 107 movement or sound for a limited time, or until a certain elapsed time absent further input; until sufficient signal 2 has been input to allow a signal match 5; or until a succeeding transmission 1 of another transmission type 11 or signal type 21 commences, the change of type 11 itself 40 indicative of previous transmission 1 termination. For example, changing from cursor/mouse movement to mouse button clicking may be considered a change in signal type 21, and hence a possible basis for passive termination. Biometric transmission 1 is typically passively terminated 45 77: software terminates submission 9 when sufficient biometric signals 2 have been recorded.

Odom, col. 4, lines 31-46. The cited portion of Odom discloses passive termination of data collection. Furthermore, according to Odom, the data collected is part of a user submission to establish at least a user signature. Odom, col. 3, lines 5-15. Odom's Figs. 9-10 show how signatures are input in response to display of a submission screen (40). Odom, col. 4, lines 57-59. Odom discloses that in some cases, a user may select which types of signals can be used for submissions using checkboxes. Odom, col. 5, lines 4-13. Odom states that such user input signals are supplied responsive to an indication of commencement of a signature input recording. Odom, col. 10, lines 43-44. In every case, Odom's submissions and signatures are responsive to a request, indication, or prompt by a computer system. Such data acquisition is active, i.e., in response to a request for data. Odom does disclose that active data acquisition can be passively terminated, but Odom fails to teach or suggest passive data collection. For at least this reason, claim 1 and its dependent claims are properly allowable.

Independent claim 9 recites in part, "passively collecting behavioral biometric information from the mouse." Neither Brown nor Odom teaches or suggests such passive information collection. Brown merely discloses using predetermined keystroke sequences. Odom fails to cure the deficiencies of Brown. Odom describes specific sequences which must be duplicated, or at least approximately duplicated, by a user for authentication. In contrast, claim 9 recites "passively collecting behavioral biometric information," i.e., collecting user data without any prompts for text input or requests for mouse movements. As noted above, Odom discloses passive termination of data collection, but fails to teach or suggest passive data collection.

Because Brown and Odom fail to disclose all the features of claim 9, claim 9 and its dependent claims are properly allowable.

Claim rejections under 35 U.S.C. §103 in View of Brown, Odom, and Boebert or Akiyama

Claim 3 is rejected as obvious from a combination of Brown, Odom, and Boebert et al., U.S. Patent 5,596,718 (hereinafter “Boebert”). Claims 4-5, 7-8, 14, and 20-22 are rejected as obvious from a combination of Brown, Odom, and Akiyama, U.S. Patent 5,768,387 (hereinafter “Akiyama”). These rejections are traversed. Claims 3-5, 7-8, 14, and 20-22 depend from allowable claims 1 and 9 and are allowable for at least this reason. Applicants note that, according to Akiyama, mouse movements are detected in response to presentation of a menu screen. Akiyama, col. 11, lines 42-47 and Figs. 8-10. Thus, Akiyama discloses actively collecting mouse movement data, and Akiyama does not disclose or suggest passive data collection as claimed. For this reason, Akiyama fails to cure the deficiencies of Brown and Odom and all pending claims are patentable over any combination of these references. In addition, dependent claims 3-5, 7-8, 14, and 20-22 recite additional features and combinations of features that are novel and non-obvious over the cited references, but to expedite prosecution, these rejections are not belabored further herein.

New Claims 23-26

New dependent claims 23-24 are properly allowable as dependent from allowable independent claims 9 and 1, respectively. In addition, these new claims recite additional features that are lacking in the proposed Brown/Odom combination. For example, new claim 23 recites that “the behavioral biometric information from the mouse is obtained in a background process.” In contrast, the Brown/Odom combination discloses obtaining data in response to requests for data, i.e., in a foreground process. New claim 24 recites “establish[ing] a user signature based on a plurality of sessions in an enrollment mode.” In contrast, the Brown/Odom combination discloses obtaining user signatures in a single session, and the Brown/Odom combination does not teach or suggest acquiring data in a plurality of sessions to establish a user signature.

New independent claims 25-26 recite additional features and combinations of features that are patentable over the proposed Brown/Odom/Akiyama combination. For example, new independent claim 25 recites “a data interception unit for receiving inputs from a user, wherein

the data interception unit is configured to passively initiate collection of mouse data.” As noted above, this feature is not disclosed in the proposed Brown/Odom/Akiyama combination. While Odom discloses passive termination of data collection, Odom fails to teach or suggest passive initiation of collection of mouse data. Independent claim 26 recites “a data interception unit for receiving inputs from a user, wherein the data interception unit is configured to transparently collect mouse data generated in response to the user.” The proposed Brown/Odom/Akiyama combination fails to teach or suggest at least this feature. Instead of transparent collection of mouse data in which the data interception unit collects mouse data without affecting the applications for which the mouse data is intended, data collection in the proposed Brown/Odom/Akiyama combination is in response to a prompt such as a display screen so that the data is directed to an intended application such as a signature recordation application. For at least these reasons, new independent claims 25-26 are properly allowable.

Summary

The pending claims are directed to methods and apparatus that permit user authentication without requiring a user to duplicate passwords, passphrases, mouse sequences, or other predetermined submissions. In contrast, Brown and Odom merely apply biometrics to conventional password based systems. The novel and non-obvious claimed methods and apparatus permit arbitrary user input gestures to be used for authentication, and predetermined passwords, graphical sequences, and prompts to enter specific authentication information are not needed. The Odom reference explicitly acknowledges this key difference: “Computer login may comprise any user determined submission.” See Odom, Abstract. In contrast, in the claimed apparatus and methods, there are no user determined submissions - the user merely begins to use the keyboard or the mouse.

Conclusion

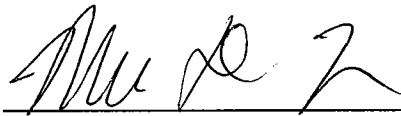
For at least the above reasons, all pending claims are in condition for allowance and action to such end is respectfully requested. If any issues arise, or if a telephone conference is deemed helpful, the Examiner is requested to telephone the undersigned.

Respectfully submitted,

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By

A handwritten signature in black ink, appearing to read 'Michael D. Jones', written over a horizontal line.

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